REMARKS

Claims 1, 2 and 4-6, as amended, remain herein.

Claim 1 has been amended to add a step of allowing electrode material film to remain only on prescribed electrode regions, the remaining electrode material film, after having been exposed and developed, resulting in remaining areas of the electrode material film whose thickness in cross section is trapezoidal and widens in an outward direction from an interface of the remaining areas with the circuit board. See applicants' specification at page 7, line 33 to page 8, line 24, and claim 3, now cancelled.

Claim 3 has been cancelled without prejudice or disclaimer.

Claims 2, 5 and 6 have been edited for clarity.

1. Objections were stated to the drawings for allegedly showing prior art. Submitted herewith is a copy of Figure 3 revised to include a label indicating "Prior Art." Withdrawal of the objection to the drawings is respectfully requested.

2. Claims 1-6 were rejected under 35 U.S.C. §103(a) over Kazunari JP 08-222840, Duesman et al. U.S. Patent 6,331,736, and Applicants' Admitted Prior Art (AAPA), Fig. 3.

The presently claimed method for packaging a flip-chip comprises the steps of (1) exposing and developing electrode material film, resulting in remaining areas of the electrode material film whose thickness in cross section is trapezoidal and widens in an outward direction from an interface of the remaining areas with the circuit board, and (2) baking the trapezoidal electrode material remaining areas to form concave circuit electrodes, as recited in applicants' claim 1. This method and corresponding arrangement are nowhere disclosed or suggested in either of the cited references.

The Office Action admits that Kazunari JP '840 does not disclose printing a material that contains a photopolymerizable material or connecting the protruding electrode and circuit electrodes via a conductive resin. However, contrary to the suggestion in the Office Action, there are additional differences between the Kazunari JP '840 manufacturing process and the presently claimed invention.

In Kazunari JP '840, an electrode pad forming pattern 18 is formed by laying photoresist layer 12 over ceramic substrate 11 as shown in Kazunari JP '840, Fig. 1(a); photo mask 13 is laid on top of layer 12 to be exposed, as shown in Kazunari JP '840, Fig. 1(b); recess sections 15 are formed in layer 12, as shown in Kazunari JP '840, Fig. 1(c); conductor

paste is filled in recess sections 15, as shown in Kazunari JP '840, Fig. 1(d); photoresist layer 12 is dissolved with alkaline solution, as shown in Kazunari JP '840, Fig. 1(e); electrode pad forming patterns 18 are formed by baking dried bodies 17 left in Fig. 1(e), as shown in Kazunari JP '840, Fig. 1(f); and patterns 18 are covered with electrodeless-plated layers 19, as shown in Kazunari JP '840, Fig. 1(g).

Kazunari JP '840, Figs. 1(a)-1(g), does not show any electrode material having trapezoidal cross sections, nor is there a description of any step for forming such cross sections.

In the presently claimed method, paste electrode material 2 is laid over circuit board 1 as shown in Fig. 1(a), and a glass mask 3 is located over material 12 and exposed as shown in applicants' Fig. 1(b). But, in contrast to Kazunari JP '840, the later processes shown in applicants' Figs. 1(d) and 1(e) completely differ from those of Kazunari JP '840. That is, electrode material 2, which has been exposed and developed, remains trapezoidal in cross section, as shown in applicants' Fig. 1(d). When thus formed electrode regions 2a are baked, edge-curled arc-shaped circuit electrodes 4 result.

The reason why applicants' electrode regions 2a are formed as trapezoids is described in the specification at page

8, second paragraph, and the reason why they result in an arc shape is described in the third paragraph of the same page. Kazunari JP '840 describes the reason why the electrode pad forming pattern 18 is formed to have a 3 micron-deep recess section as: the conductor-paste-filed portion is lowered in its center due to the surface tension of the conductor paste, and is further lowered when the solvent contained in the paste volatizes, thus forming a recessed section in pattern 18.

The Office Action cited Duesman '736 for allegedly teaching a conductive photopolymerizable material, and Applicants' Admitted Prior Art (AAPA), Fig. 3, for allegedly teaching connecting protruding electrodes and circuit electrodes via a conductive resin. However, neither Duesman '736 nor AAPA suggests that it would be either beneficial or desirable to develop the electrode film material into remaining areas of trapezoidal cross section and then bake such trapezoidal remaining areas to form concave circuit electrodes, and neither reference discloses or suggests applicants' steps of (1) exposing and developing electrode material film, resulting in formation of remaining areas whose thickness in cross section is trapezoidal, and (2) baking the trapezoidal electrode material remaining areas to form concave circuit electrodes, as recited in applicants' claim 1.

For the foregoing reasons, none of Kazunari JP '840, Duesman '736 or AAPA contains any teaching, suggestion, reason, motivation or incentive that would have led one of ordinary skill in the art to applicants' claimed invention. Nor is there any disclosure or teaching in any of these references that would have suggested the desirability of combining any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Claims 2 and 4, which depend from claim 1, are allowable for the same reasons described herein for claim 1, and claims 5 and 6 are allowable for the same reasons described herein for claim 1. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

All claims 1, 2 and 4-6 are now proper in form and patentably distinguished over all grounds of rejection cited in the Office Action. Accordingly, allowance of all claims 1, 2 and 4-6 is respectfully requested.

Should the Examiner deem that any further action by the applicants would be desirable to place this application in even better condition for issue, the Examiner is requested to telephone applicants' undersigned representatives.

Respectfully submitted,

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Date

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RWP:RNW/mhs

Attachments: 1 annotated sheet showing changes Fig. 3
1 replacement sheet Fig. 3

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IN THE DRAWINGS:

Please replace the attached one (1) sheet of formal drawing depicting Figure 3 for Figure 3 originally filed with the application.

FIG. 3
Prior Art